

U.S. Nuclear Regulatory Commission  
Office of Nuclear Security and Incident Response



**Enhancing Security for Radioactive Materials**



Northern Ohio Symposium on Homeland Security and  
Radiation Emergency Preparedness  
October 16, 2004

## Overview

- Office of Nuclear Security and Incident Response
- Threat Environment
- Enhancements to Security
- Target Identification
- Force-on-Force Exercises
- Materials Security Working Group
- Plan Forward

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## Office of Nuclear Security and Incident Response

NSIR was created in April 2002 to:

- improve communications and coordination both within and external to the NRC on security issues
- serve as the central point of contact with the Department of Homeland Security
- oversee the incident response function
- oversee emergency preparedness planning

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## Threat Environment



- Known interest of terrorists to acquire Radioactive Materials
- No specific credible threats
- General threat continues
- Not clear that terrorists recognize most attractive sources
- Open information sources are abetting terrorists

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## Target Identification

- What do we protect against?
- **WMD ?** - Weapon of Mass *Disruption*
- **Radiological Dispersal Device (RDD)**  
"A device or mechanism that is intended to spread radioactive material from the detonation of conventional explosives or other means."

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## Target Identification

- **Radiological Exposure Device (RED)**  
"A device whose purpose is to expose people to radiation, rather than to disperse radioactive material into the air, as would an RDD. An RED could be constructed from unshielded or partially shielded radioactive materials in any form placed in any type of container."

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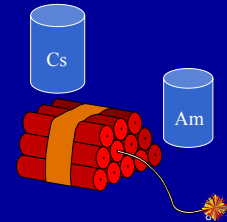
## Target Identification

- Potential Consequences of an RDD/RED
  - Explosion impacts
  - Health and safety impacts
    - catastrophic health effects,
    - mass casualties,
    - land contamination
  - National security and function impacts
  - Social disruption impacts
    - Psychological
    - Economic

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## Factors Affecting Consequences/Vulnerabilities

- Number of sources
- Quantity (Activity)
- Longevity (Half-life)
- Radiotoxicity ( $\alpha$ ,  $\beta$ ,  $\gamma$ , or  $n$ )
- Form
- Accessibility
- Dispersal Method



## Form

- Chemical & biochemical properties
- Dispersible
  - Sealed or unsealed
  - Metal, ceramic, powder, liquid, or gas
- Particle size
- Exposure pathway
  - Plume, ground shine, food & water
  - inhalation, ingestion, & absorption

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## Accessibility

- Conditions of use
- Fixed facility
- Temporary job site
- Transportation
- Import/Export

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## Dispersal Method

- Large bomb
  - large contamination area
  - Larger exposed population
  - low health effects
- Small Bomb
  - Small contamination area
  - Smaller exposed population
  - Possible significant health effects
- Other mechanisms to spread contamination
- Radiological Exposure Devise (RED)

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## Target Identification

- DOE/NRC Risk Assessment
  - Initial high-level assessment of radioisotopes of greatest concern
  - Relative rather than absolute indication
  - Analysis & expert judgment
  - Used radiological dose consequence
  - Relative groupings

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## Target Identification

- IAEA Risk Assessment
  - Code of Conduct for the Safety and Security of Radioactive Sources
  - TECDOC-1344  
Categorization of radioactive sources  
July 2003

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## Target Identification

- IAEA TECDOC-1344 Criteria
  - Potential for radioactive sources to cause deterministic health effects
  - Severe deterministic effect
    - fatal or life threatening or
    - results in a permanent injury that decreases the quality of life
  - Uses concept of a 'dangerous' source, D-value

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## Enhancements to Security

- Order – February 25, 2002
  - Increased patrols
  - Augmented security forces and capabilities
  - Additional security posts
  - Installation of additional physical barriers
  - Vehicle checks at greater stand-off distances
  - Enhanced coordination with law enforcement
  - More restrictive site access controls for all personnel
- Ongoing verification through NRC inspection
- Will remain in effect until no longer needed, afford time to implement the Design Basis Threat (DBT) and to complete systematic threat, vulnerability and consequence analyses

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## Additional Orders Regarding Security

- Power reactors
  - Access Authorization (1/7/03)
  - Guard training and qualification (4/29/03)
  - Work hours and guard fatigue (4/29/03)
  - Revised design basis threat (4/29/03)
- Uranium Conversion facilities (3/25/02)
- Decommissioning reactors and wet ISFSIs (5/23/02)
- Category I (8/21/02) & Category III fuel facilities (2/6/03)
- Gaseous diffusion plants (6/17/02)
- Transportation of spent nuclear fuel (10/3/02)
- Dry ISFSIs (10/16/02)
- Panoramic irradiators (6/6/03)
- Manufacturing and Distributors (1/12/04)
- ISFSIs, Decommissioning Reactors & Uranium Conversion facilities
  - Access Authorization (8/18/04)
  - Fatigue (Pending)

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## Force-on-Force Exercises

- Suspended Force-on-Force (FOF) testing after September 11, 2001
- Implemented tabletop pilot program July 2002
- Initiated pilot FOF exercises in February 2003 implementing enhancements
- Transitional Force-on-Force exercises are continuing



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## Transitional Force-on-Force Exercises

- Major changes from earlier Force-on-Force program:
  - Increased frequency
  - Expanded adversary characteristics
  - Use of Multiple Integrated Laser Engagement System
  - Active insider
  - Attack from owner controlled area
  - Expanded weaponry/explosives
  - Includes Emergency Preparedness and Operations

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## Status of Transitional Force-on-Force Program

- Transitional program to continue until October 29, 2004 when the NRC's supplemented DBT is effective
- Clarifying appropriate regulatory objective for FOF exercises (e.g. inspection, training)
- Considering appropriate adversary force composition
- Lessons-learned report to be developed

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## Materials Security Working Group (MSWG)

- Establishes liaison with State agencies to develop enhanced security requirements, including:
  - Physical protection
  - Access authorization
  - Transportation controls
  - Import/Export controls
  - Coordination among local, State and Federal responders

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## Materials Security Working Group (cont.)

- Radionuclides and thresholds of concern consistent with international values
- Requirements to be issued as Orders under Commission's Common Defense and Security Authorization
- Graded approach based on risk to public
- Formation of Materials Security Steering Committee

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## Materials Security Plan Forward

- Protective Measures for other licensees with high-risk sources
- LQ RAM Transportation Orders
- Proposed rulemaking on Import & Export controls
- Continue Vulnerability Assessments (VA)
- Rulemaking to codify Security Orders & other security enhancements
- Continue interactions with other Federal agencies (DHS, DOE, EPA, FEMA, CBP, DOT ... etc)
- Continue interactions to implement the IAEA Code of Conduct

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## Conclusion

- NRC will proceed ahead to enhance the security of radioactive materials
- Work with other Federal agencies to keep informed of the threat and refine the identification of targets
- Continue Force-on-Force exercises
- Continue the interface with other Federal and State agencies
- Revise the path forward as necessary

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Any Questions?



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